

Patent Claims

- 1) Device for generating extreme ultraviolet and soft x-rays from a gas discharge, wherein there are two main electrodes (1, 2), between which there is a gas-filled space (7); wherein each main electrode (1, 2) exhibits an opening (3, 4), by means of which an axis of symmetry (5) is defined; and wherein the electrodes are formed in such a manner that the gas discharge forms exclusively in the volume, determined by the aligned openings (3, 4); and where the plasma channel, generated on the axis of symmetry, is the source for the EUV and / or x-rays, **characterized in that** there are means (8, 9a, 9b, 13a, 13b, 14, 15, 17) for increasing the conversion efficiency.
- 2) Device, as claimed in claim 1, **characterized in** that at least one of the openings (3, 4) on the side facing away from the space (7) is larger than on the side facing the space (7).
- 3) Device, as claimed in claim 2, **characterized in** that the openings (3, 4) exhibit the shape of a truncated cone.
- 4) Device, as claimed in at least one of the claims 1 to 3, **characterized in** that the anode opening (2) is designed as a non-continuous depression, and in particular as a blind hole.
- 5) Device, as claimed in at least one of the claims 1 to 4, **characterized in** that an auxiliary electrode (9a, 9b) is provided.
- 6) Device, as claimed in claim 5, **characterized in** that an

auxiliary electrode (9a) is provided behind the opening (3, 4) of one of the main electrodes (1, 2).

- 7) Device, as claimed in claim 5, **characterized in** that an auxiliary electrode (9b), which exhibits an opening on the axis of symmetry (5), is provided between the main electrodes (1, 2).
- 8) Device, as claimed in at least one of the claims 1 to 7, **characterized in** that both main electrodes (1, 2) exhibit several openings (14).
- 9) Device, as claimed in claim 8, **characterized in** that the openings (14) in the main electrodes (1, 2) are arranged on a circle, through whose center runs the axis of symmetry (5).
- 10) Device, as claimed in at least one of the claims 1 to 7, **characterized in** that both main electrodes (1, 2) exhibit a ring-shaped opening (17), whereby the center of the ring (17) lies on the axis of symmetry (5).
- 11) Device, as claimed in at least one of the claims 1 to 10, **characterized in** that a pulse-forming network (11) is provided as the power supply.
- 12) Device, as claimed in at least one of the claims 1 to 11, **characterized in** that, in addition to the gas inlet and outlet opening for the working gas in the electrode space (7), there is at least one additional gas inlet or gas outlet opening (13a, 13b).
- 13) Device, as claimed in at least one of the claims 1 to 12, **characterized in** that a system of capillaries for vacuum

separation is provided between the gas-filled space (7) and the highly evacuated areas (19) of the device.

- 14) Device, as claimed in claim 13, **characterized in** that the system of capillaries is a micro channel plate or a Kumakhov lens.